REMARKS

Favorable reconsideration of this application is respectfully requested.

Claims 1, 2, 4-8 and 10-26 are present in this application. Claims 1, 2, 4, 5 and 16-18 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. 4,893,165 (Miller et al.) in view of U.S. 5, 331, 184 (Kuwahara). Claims 6-8, 10-15 and 19-26 are withdrawn from consideration as directed to a non-elected species. It is noted that page 1 of the Office Action summary states that claims 1, 2, 4-8 and 16-18 are pending in the application.

As pointed out on page 7 of the prior response, the present invention is directed to an electrode contact section incorporated into a semiconductor device. It is advantageous to reduce the resistance of the electrode contact section, without decreasing the turn-off speed of the device. The present invention, in one example, includes an impurity layer in the contact section and a contact layer formed in the impurity layer. In the device as recited in claims 1 and 16, the impurity region has a thickness not more than 1.0 μm from one surface of the substrate and the contact region has a thickness not more than 0.2 μm from the one surface. Such a structure can reduce contact resistance as well as provide good turn-off speed in the device.

Turning to the prior art rejection, the Office Action refers to column 2, lines 64-66 of Miller et al. stating that the thickness of layer 15 is less than 1 μm and preferably about 0.1 μm. The Office Action correctly recognizes that the Miller et al. fails to teach the structure of claims 1 and 16 having a contact layer and an impurity layer. The Office Action looks to Kuwahara to remedy the deficiencies of Miller et al.

Kuwahara discloses anode regions 21 formed in anode layer 11. Anode layer 11 has a thickness of 10-50 μm and anode region 21 has a thickness of 2 to 5 μm. The Office Action asserts that Kuwahara discloses the relation of the thickness of the anode region 21 to be at

least 1/5 of the thickness of the anode layer 11. However, Kuwahara merely proposes 2-5 μm as an example of the thickness of the anode region 21 and 10-50 μm as an example of the thickness of the anode layer 11. The thickness of the anode layer is not related to that of the anode region. In other words, the examiner's statement that Kuwahara discloses a thickness ratio (1/5) between a contact layer and impurity layer, as recited in claims 1 and 16, has no basis. Clearly, Kuwahara does not specify a thickness ratio. Using the ranges of layer 11 and region 21, layer 11 is 2-5 times as thick as region 21 when layer 11 is 10 μm thick. Kuwahara places no significance on any relationship of the thicknesses of layer 11 and region 21 and, importantly, makes no suggestion as to any advantage of the thickness of layer 11 compared to region 21, or vice versa.

The Office Action also does not make any case or provide any evidence that one skilled in the art would include an anode region 21 into the layer 15 of Miller et al. This is the appropriate inquiry, and not whether region 21 would be included in a layer such as layer 11. There is no disclosure or suggestion in either reference that zone 15 thus would require or benefit from an anode region 21. The Office Action simply points out how Kuwahara discloses the anode region 21, but region 21 is included in anode layer 11. There is no disclosure or suggestion, and the Office Action does not identify any disclosure or suggestion, that one skilled in the art would include an anode region 21 in a layer such as 15 in Miller et al. Clearly, the combination of Miller et al. and Kuwahara fails to disclose or suggest the present invention as recited in claims 1 or 16 for these additional reasons.

The Office Action also asserts that it would have been obvious to determine optimum or working ranges where the general conditions of a claim are disclosed in the prior art. However, the Office Action has not established that the general conditions of a claim in this application are disclosed in the prior art. No reference discloses an impurity layer having a thickness less than 1 μm and a contact layer less than 0.2 μm. The inventors in this

application discovered the remarkable advantages of the reduction of contact resistance and increase in the turn-off speed for a device having the impurity and contact layers recited in claims 1 and 16. No reference discloses or suggests that the thicknesses of the layers would bring about such results. Kuwahara simply makes no suggestion regarding the thickness of layer 11 with relation to the anode region 21. Moreover, there is clearly no suggestion of an impurity layer having a thickness less than 1 μm. Miller et al. also fails to suggest any relationship of thicknesses of layers as only one layer is disclosed. Therefore, it has not been established that the general conditions of a claim in this application are disclosed. Thus, the clearly advantageous device having the layers of the thicknesses recited in claims 1 and 16 would not be obtained through routine skill. The present invention has remarkable advantages not disclosed or suggested by the prior art, in particular the teachings of Miller et al. and Kuwahara.

It is respectfully submitted that the present application is in condition for allowance and a favorable decision to that effect is respectfully requested.

Respectfully submitted,

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